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Spruce Budworm in Southern Idaho

Appraisal - Aerial Survey

August - September 1957

By

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SPRUCE BUDWORM IN SOUTHERN IDAHO
APPRAISAL - AERIAL SURVEY

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INTRODUCTION

Since 1952 the spruce budworm, Choristoneura fumiferana (Clem.), has increased in extent and severity in southern Idaho. Control projects have been conducted annually since 1955 with the last area of old infestation being sprayed in 1957. To date, 2,029,747 acres of Douglas-fir, true firs, and spruce have been sprayed for budworm (table 1).

Table 1. Year, forest, and acreage of Budworm Control Projects in Southern Idaho

Year	Forest	Acreage
1955	Boise	741,214
	Payette	<u>152,000</u>
	Total	893,214
1956	Boise	211,092
	Challis	10,880
	Payette	98,112
	Salmon	139,805
	Targhee	<u>16,012</u>
	Total	475,901
1957	Boise	92,366
	Challis	20,110
	Payette	374,181
	Salmon	55,610
	Targhee	<u>118,365</u>
	Total	660,632
	Grand total	2,029,747

For the third year intensive ground and aerial survey methods have been coordinated to better evaluate budworm damage. The purpose of these surveys is to locate current budworm damaged areas, possible reinfestation within areas sprayed, and to determine the severity of defoliation.

SURVEY METHODS

Aerial Survey

The aerial survey in 1957 was flown in the usual manner, i. e., at an altitude commensurate with safety and good observations, and using major drainages as working units on each forest. Three degrees of intensity of damage were used: light, medium, or heavy. Maps of 1/4-inch scale were used for orientation and sketch mapping. Description and extent of damaged areas were recorded on the electronic recorder.

Appraisal Survey

The sequential plan, based on a 100-bud (new growth tip) sample, was again used to sample budworm defoliation. In addition to sampling current damage, past damage was visually estimated and recorded as to intensity and years of occurrence.

Coverage

The aerial phase covered every forested drainage on five of the six national forests surveyed by this office. The West Division of the Targhee National Forest was omitted this year since the majority of the Douglas-fir and true fir type was sprayed in 1957.

The aerial observer directed the movements of the appraisal survey crew. This crew sampled practically all the areas recorded from the air. Thus the boundaries of infestations were drawn from the air while the intensity and confirmation of the presence of budworm was determined on the ground. Only those most inaccessible areas were not sampled by the appraisal survey crew.

RESULTS

The survey and evaluation of budworm damage was somewhat complicated this year due to the presence of damage by spider mites, a defoliator that seems to be host specific on alpine fir and, in a few areas, Douglas-fir needle blight. At first glance, the approximate 490,300 acres of defoliation would seem to indicate that the budworm is not

subsiding in southern Idaho. This may be true. However, the majority of the acreage is made up of small, widely separated areas. Of the 24 areas of infestations only 9 are over 20,000 acres in size and only 5 of these over 40,000 acres.

There were approximately 135,400 acres of reinfestation within the past sprayed areas. Of this, approximately 84,100 acres could have been reinfested by migrating moths; 17,600 acres were known to have received poor spray coverage in 1956; and the remaining 33,700 acres probably resulted from spray misses which represents only 1.66 percent of the cumulated total acreage sprayed for budworm in southern Idaho

Each infestation is described and keyed on the attached map by forest. There are approximately 143,900 acres of heavy defoliation; 267,600 acres of medium defoliation; and 78,800 acres of light defoliation in southern Idaho. The two-man ground appraisal crew established 62 sample plots containing 218 trees. Of the trees sampled 72 percent were Douglas-fir, 10 percent alpine fir, 12 percent white fir, and 6 percent Engelmann spruce. A total of 111 hours and 45 minutes were flown during the aerial survey.

I. Boise National Forest

To date 1,044,672 acres of the Boise National Forest have been sprayed for the control of the spruce budworm. The size of the infestations appears to be declining even though each year the survey reveals new infestations ranging from light to heavy intensities.

The 1957 survey showed approximately 39,000 acres infested with budworm. Of this, 13,700 acres were of light defoliation, 17,600 acres medium, and 7,700 acres of heavy defoliation. There were 9 sample plots established containing 27 trees; 96 percent were Douglas-fir and 4 percent white fir. A survey was not done in Area C since a budworm research study plot had been established there.

Area A. Sulphur Creek--17,600 acres. This is a reinfestation causing a medium degree of defoliation within the Sulphur Creek-Dagger Creek drainages. This area in particular received rather poor coverage in 1956 control project; consequently a reinfestation was to be expected. Intensive sampling as part of the budworm research study is planned for this area. This area definitely threatens the surrounding timber and is probably the source of the infestation in Rapid River on the Challis National Creek.

Area B. Tripod Mountain--13,700 acres. The infestation within Area B has been present in an endemic state for several years. The damage is light and the budworm does not offer any particular threat.

Area C. Coulter Summit--7,700 acres. The infestation has been present in this area for about 3 years. The budworm probably migrated during the fall of 1954 from the area sprayed in 1955 on the north. Since a fall, damage-type survey reveals only the present year defoliation and not now infestations, this area was not included to be sprayed in 1955. The severity of defoliation has increased annually, yet the expansion in acres has been rather slow.

A budworm research plot was established here and intensive sampling studies began in the spring of 1957.

II. Challis National Forest

The Challis National Forest has presented no budworm problem of any magnitude. Some 30,990 acres that were adjacent to larger areas of infestations on bordering forests were sprayed in 1956 and 1957.

Three small areas of budworm infestations were located on the forest. Two of these areas were not ground checked due to inaccessibility and the third was only scouted due to the endemic level of infestation.

Area D. Loon Creek--6,400 acres. Two spot infestations comprise this area and vary from light to medium defoliation. Both areas, Loon Creek Peak and Pinyon Peak, are now infestations and do not represent any serious threat at the present time.

Area E. Rapid River--3,700 acres. This area lies between Sheepeater Hot Springs and Rapid River, extending up into the drainage. The damage was classified as medium and the infestation judged to be 1 or 2 years old. The budworm probably migrated into this area from area sprayed on the Boise National Forest in 1956.

Area F. Basin Creek--8,100 acres. The infestation within this area has been present for 2 to 3 years and has remained static in size and severity of damage. The area lies between the headwaters of Basin and Valley Creeks and the defoliation ranges from light to medium.

III. Payette National Forest

Within the past three years approximately 624,293 acres have been sprayed for the spruce budworm. The most serious of these infestations was in Big Creek, some 374,000 acres, and was successfully treated in 1957.

The appraisal-aerial surveys revealed approximately 71,400 acres of bud-worm damage. Of this, 24,600 acres were of light damage, 44,600 acres--medium, and only 2,200 acres heavy. The appraisal survey crew established 23 plots containing 68 trees, 35 percent Douglas-fir, 28 percent alpine fir, 28 percent white fir, and 9 percent Engelmann spruce. The 1955 and 1956 sprayed areas were thoroughly scouted or sampled for possible reinfestations.

The present acreage of defoliation is composed of many infestations separate from one another.

Area G. Brundage Reservoir--8,600 acres. This infestation lies between Brundage Reservoir and Upper Hayard Lake. The damage has remained light for several years and the infestation is not considered particularly threatening.

Area H. Pilot Peak--7,300 acres. Pilot Peak forms the center of this infestation. In general there is medium damage with some heavier defoliation on the north slopes. This infestation is relatively new and probably represents only a "hot spot" similar to those sprayed in this general area in 1957.

Area I. Council Mountain--21,800 acres. These two infestations have been present for 2 to 3 years and have remained static in size and severity of damage. The one west of Cascade Reservoir was first reported in 1955 and covers approximately 12,000 acres of medium damage. The East Fork of the Weiser River area began in the same year and contains approximately 9,800 acres of light defoliation.

Area J. Rapid River--27,500 acres. This area is composed of several reinfestations within the past sprayed areas. The most severe defoliation lies within the bottom of Rapid River. However, about 2,200 acres are heavily damaged south of Round Valley. The rest of the Rapid River and Deep Creek drainages, approximately 21,300 acres, contain medium damage. Two small areas of light damage were located in Huntley Gulch (2,500 acres) and west of Lost Valley Reservoir (1,500 acres).

Area K. Cuddy Mountain--6,200 acres. Two areas; Hornet Creek (4,000 acres) and No Business Creek (2,200 acres), were found to contain medium and light defoliation, respectively. These infestations are occurring within the area sprayed in 1956.

IV. Salmon National Forest

The spruce budworm remains in epidemic proportions on the Salmon National Forest. Within the past 2 years approximately 195,415 acres have been sprayed. Of this, 55,610 acres were adjacent to and sprayed in conjunction with the Big Creek infestation on the Payette National Forest.

The aerial and appraisal surveys revealed 284,400 acres currently infested on the Salmon Forest. There were 150,400 acres containing a medium degree of damage, and 134,000 acres of heavy damage. Those areas include new, heavy infestations, old infestations, increasing in severity and reinfestations. For the most part the areas are widely separated and the reinfestation probably caused by migrating moths. There were 24 sample plots containing 106 trees established by the appraisal crew--87 percent Douglas-fir, 6 percent white fir, 4 percent Engelmann spruce, and 3 percent alpine fir.

Area L. Carmen Creek--8,100 acres. The infestation within this area has been present for 2 to 3 years. Last year it was reported as practically non-existent, yet the 1957 survey shows a heavy degree of defoliation.

Area M. Wagonhammer Creek--6,400 acres. This is another infestation that was practically nil in 1956, yet has increased in intensity ranging from medium to heavy defoliation in 1957.

Area N. Dahlonoga Creek--10,400 acres. This is a relatively new infestation with defoliation ranging from light to heavy. The heaviest concentration occurs between Smithy and Nez Perce Creeks. It is assumed that this infestation is an extension of the Montana budworm infestation.

Area O. Long Tom Mountain--4,000 acres. This new infestation of medium damage lies south of Long Tom Mountain and is not particularly serious.

Area P. Indian Peak--84,100 acres. Migrating moths may have caused this reinfestation within a unit sprayed in 1956. Heavy budworm damage was most prevalent towards the back ridges while light defoliation exists in most of the creek bottoms. The acreage figure is gross, consequently the actual acres of heavy damage is considerably less.

- Area Q. Squaw Creek--66,800 acres. A new infestation was found between Squaw Creek on the east and Owl Creek on the west, and from the Salmon River to the Montana Border. The heaviest damage occurs within Squaw Creek and lessens in intensity within Owl Creek. The Squaw Creek drainage lies adjacent to the area sprayed in 1956 and could possibly be an extension of that infestation.
- Area R. Horse Creek--3,600 acres. The infestation within this drainage was reported last year as light and considerably larger in size. This year only 3,600 acres of medium defoliation was seen from the air. The area is reasonably inaccessible for ground sampling.
- Area S. Big Deer Creek--42,300 acres. This infestation is apparently new, or at least was not discernible from the air last year. The most severe defoliation is within the Big Deer Creek and Clear Creek drainages, tapering to light defoliation around Gant Mountain.
- Area T. Porphyry Creek--8,900 acres. Though rather small in acreage this new infestation ranges from medium to heavy in degree of intensity.
- Area U. Yellowjacket Mountains--49,800 acres. The budworm defoliation within this area ranges from light to heavy in intensity. The damaged area is bounded by the Middle Fork of the Salmon River on the west and extends eastward to include the Yellowjacket Creek, from Camas Creek on the south to Wilson Creek, McElory Mountain and the Yellowjacket Ranger Station on the north. This infestation is probably an extension of the Big Creek epidemic on the Payette National Forest and due to the life cycle of the budworm, and a damage-type survey was not discovered until this fall.

V. Sawtooth National Forest

For the first time in three years the area of defoliation has increased in size. The aerial and ground surveys revealed approximately 99,300 acres of budworm damage. The budworm was reported in the Sawtooth Forest in 1949 and since that time the population and damage has fluctuated annually until 1957.

The aerial and appraisal surveys revealed approximately 29,300 acres of light defoliation and approximately 70,000 acres of medium. There were 6 sample plots containing 17 trees established by the survey crew. Of these, 88 percent were Douglas-fir and 12 percent Engelmann spruce. A budworm research plot was established this spring within Boardman Creek and intensive sampling studies begun. Consequently only those new infestations were sampled by the survey crew.

Area V. Warm Springs Creek--5,300 acres. Several new and endemic situations were located within Carrie, King-of-the-West, and Blackhorse Creeks. These will be under further surveillance during next year's research studies.

Area W. South Fork of the Boise River--70,000 acres. The original budworm infestation on the Sawtooth National Forest was approximately 42,200 acres extending from Salt Creek to Deadwood Creek south of the river and from Bear Creek south along the river. The Grouse Creek area is a new infestation of approximately 5,800 acres containing light to medium defoliation. The infestation north of the river between Cayuse and Skeleton Creek can be considered a new infestation containing from light to heavy defoliation covering approximately 22,000 acres.

The old infestation was reported last year as causing heavy defoliation. However, research studies in the area have determined this to be medium for 1957. The survey crew found an above average of pupal parasitism both in Bounds Creek and in Shake Creek.

Area X. Ross Fork-Paradise Lookout--24,000 acres. This area is merely an extension of area W and is mentioned separately only because of its static existence of light defoliation.




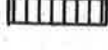

Table 2. Areas, acreages and severity of spruce budworm defoliation in southern Idaho-1957

National Forest	Area	Acreage of defoliation			Forest acreage
		Light	Medium	Heavy	
Boise	A-Sulphur Creek	--	17,600	--	17,600
	B-Tripod Mountain	13,700	--	--	13,700
	C-Coulter Summit	--	--	7,700	7,700
	Totals	13,700	17,600	7,700	39,000
Challis	D-Loon Creek	3,100	3,300	--	6,400
	E-Rapid River	--	3,700	--	3,700
	F-Basin Crook	8,100	--	--	8,100
	Totals	11,200	7,000	--	18,200
Payette	G-Brundage Res.	8,600	--	--	8,600
	H-Pilot Peak	--	7,300	--	7,300
	I-Council Mountain	9,800	12,000	--	21,800
	J-Rapid River	4,000	21,300	2,200	27,500
	K-Cuddy Mountain	2,200	4,000	--	6,200
	Totals	24,600	44,600	2,200	71,400
Salmon	L-Carmon Creek	--	--	8,100	8,100
	M-Wagonhammer Cr.	--	--	6,400	6,400
	N-Dahlonaga Creek	--	--	10,400	10,400
	O-Long Tom Mountain	--	4,000	--	4,000
	P-Indian Peak	--	84,100	--	84,100
	Q-Squaw Creek	--	--	66,800	66,800
	R-Horse Creek	--	3,600	--	3,600
	S-Big Doer Creek	--	--	42,300	42,300
	T-Porphry Creek	--	8,900	--	8,900
	U-Yellowjacket Mountains	--	49,800	--	49,800
	Totals	--	150,400	134,000	284,400
Sawtooth	V-Warm Springs Cr.	5,300	--	--	5,300
	W-So. Fk. Boise River	--	70,000	--	70,000
	X-Ross Fk.-Paradise Lookout	24,000	--	--	24,000
	Totals	29,300	70,000	--	99,300
	Grand Totals	78,800	289,600	143,900	512,300

SPRUCE BUDWORM SITUATION MAP

SOUTHERN IDAHO
BOISE, PAYETTE, SALMON, CHALLIS & TARGHEE NATIONAL FORESTS
OCT. 1957

SCALE 0 10 20 30 40 MILES

LEGEND	
	TREATED AREA PINE BUTTERFLY 1954
	TREATED AREA BUDWORM 1955
	TREATED AREA BUDWORM 1956
	TREATED AREA BUDWORM 1957
	INFESTED AREA BUDWORM 1957

